Agricultural Department.

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PUBLISHER'S NOTICE—All communications intended for this department should be addressed to PROF. J. P. STELLE, Fort Worth, Tex.

The Sugar Beet for Texas.

A good deal has already appeared in THE GAZETTE with reference to an existing reasonable probability that the culture of sugar beets and the manufacture of beet sugar might be made a decidedly profitable industry for Texas. Since the publication of those articles we have been carefully filing away for use in a future article all obtainable information bearing on the sugar beet and beet sugar industry, and the present time, when a new interest appears to be awakening with reference to the matter, as evinced by a recently published call at the hands of our efficient commissioner of immigration for information on the subject, would seem to be an auspicious time for working up a rehash of what we have been able to collect.

Senator W. D. Washburn of Minnesota, who has been making a very careful study of the beet sugar industry as at present existing within the United States, reports that the extensive manufacture of beet sugar in America may be counted upon as but just begun. Already enough is known to show most conclusively that this manufacture is not only wholly feasible, but that it is to become an industry of such gigantic proportions as are now little dreamed of by our people.

The most careful investigation has left him fully convinced that the success of the beet sugar industry is established for this country beyond any reasonable question. The prospects are entirely as bright as one could hope for them to be. In his recent visit to Grand Island, Neb., he made a thorough examination of the great plant there. It represents half a million of capital. Mr. Oxnard, who is one of the largest sugar refiners on our continent, told him there existed no doubt whatever but that on so good a showing as was already made plenty of capital would be forthcoming at the word to establish the industry in all regions capable of making the sugar beet as fair a success as it is made in Nebraska.

Present indications, he says, would put it that the American sugar-beet belt beginning in Minnesota, extends southward over the two Dakotas, across Nebraska and thence downward—how far downward is as yet undetermined. In all this great belt beets for the manufacture of sugar can be successfully grown, and the analyses so far made show that there is in them a greater per centage of saccharine matter than in the best product of either Germany or Austria. There the amount is from 12 to 14, while the beets of this belt show up to from 15 to 16. They have been using at the Grand Island factory this fall 350 tons of beets daily and turning out 60,000 pounds of first-class sugar.

Mr. Washburn says the Nebraska farmers are finding beet production very profitable. The factory pays them $3 per ton for the beets containing 12 per cent of saccharine matter, with 25 cents added for each additional per cent. As the per cent of saccharine matter depends a great deal upon the care taken in raising the beets, it will be seen that there is a marked incentive to the farmer to pay much attention to the matter of cultivation. A low average for beets is twelve and a half tons to the acre.

The running time of the Grand Island factory is about four months in each year, but since it runs night and day through that time the running season is equivalent to eight months. There has been some experimenting with silos, storing the beets for manufacture the year round, but it has proven a very expensive method.

At a late meeting of the Minneapolis, Minn., chamber of commerce Mr. F. L. Whitney submitted a map showing the American sugar beet belt. It begins in Minnesota and reaches southward, covering all the "plains" east of the Rocky mountain range and extending west, with more or less break, to the Pacific coast. It represented that almost anywhere within this belt beets could be successfully produced, yielding from 10 to 16 per cent. of saccharine matter. In his opinion the territory embraced within this belt might be made to produce beets enough to supply the whole world with sugar. President Noyes of the chamber of commerce said the report was a most important one, as interesting our whole country, and he desired to impress the matter of the sugar beet industry upon the consideration of every person living within the great beet belt.

Of course it is unnecessary for us to state that these reports spread the American sugar beet belt over Northern Texas in general and the Panhandle of Texas in particular. As the sugar beet is something of a warm-country crop, the probability exists that the further south we come on the beet belt the better it will do. Then, there is another thing to consider that certainly stands greatly in our favor: the time for running a beet-sugar factory could be made much longer in Texas than in Nebraska, on account of greater length of seasons here. The crop could be put in with us almost a month earlier than it could be put in by the Nebraska people, and it could remain in the ground almost a month later than there, thus giving us an advantage of almost two months. If it should be true, as some writers claim, that the beet must be harvested at first "ripeness," so called, to prevent loss in saccharine matter, we could easily arrange for that in a way that would enable us to cover the entire season by starting our crop "in succession"—a given acreage now, a given acreage two or three weeks later, and so on, to lengthen out the harvest period to its latest days. This arrangement would keep the mills running through from four to five months, and would, furthermore, be of important advantage to the grower, as it would prevent the whole rush of his work coming on at the same time.

It is but reasonable to suppose that these last-mentioned matters will be confronted by a reference to past beet-sugar failures in California. Those failures could cut no figure in the case, as it has been clearly proven that they were purely due to flagrant mismanagement. California is well aware of this fact, and her people make no attempt at concealing it. As an evidence of the faith that is in the California people, as far as relates to that particular matter, California is now investing millions of money with a view to the re-establishment of her beet-sugar industry. The Salinas (Cal.) Weekly Index says "there is nothing whatever the matter with the beet in that country. The whole trouble sprung from want of proper organization on the part of producers, and want of capital on the part of manufacturers. But extensive mills are now being put up in suitable localities. It is only necessary to provide sufficient capital to erect suitable works, and to understand how to manufacture sugar in the most economical way, to make the thing a general success. Of course it must be presumed that our farmers will act in hearty co-operation with our factories, and that they will fully realize the great importance and benefit it is to them to have a beet-sugar factory located in their immediate vicinity; and that they take hold of beet raising in a friendly spirit of rivalry and see who can raise the best beets for sugar. With sufficient capital to erect suitable sugar works, and with farmers interested in furnishing a full supply of good beets, there can be no such thing as a failure of the beet-sugar industry in California."

In addition to the foregoing we have a bulletin on the same subject prepared by the Salinas City Board of Trade which says: "Machinery for a great California beet-sugar factory has just arrived from Germany—too late for this season's operations, of course. Almost every county in the state is clamoring for a beet-sugar factory. The whole country seems to be aroused on the subject of sugar-beet culture. Orders for seed have been received from as far east as Ohio. So strong has been the run for sugar beet seed that there is now no more seed in California to let out. It is estimated that fully 2500 acres will be planted to sugar beets in the vicinity of Westonville for the coming season. Last (this) season there were only 1600 acres planted. An immense acreage will be planted to beets in other localities. This year the factories, owing to limited supply, will have only about a run of forty days, but the outlook at present would seem to promise them a run of three months for next year."

So, you see, the California failures, so much pointed to by persons disposed to discourage the beet-sugar industry, have not at all discouraged the Californians.

All the regions of the so-called sugar-beet belt are rousing themselves. Utah is into it, and the Daily Tribune of Salt Lake City "hopes that Mr. Stayner will succeed in establishing his farm and his beet-sugar factory, and make a complete success of the business. It would be a great thing for Utah if all the sugar used in this territory could be manufactured here. It would save sending away a great many tens of thousands of dollars annually." The Statesman of Boise City, Idaho, says: "The interest felt in the cultivation of the sugar beet in this section suffers no abatement as the season advances. All who have had any experience in beet culture know that the soil and climate of the Boise and other valleys of Southern Idaho are well adapted to this industry. There is no doubt about the very large yield per acre in beet roots, and especially in sugar beets, which grow to the largest size. What remains to be tested is the percentage of saccharine matter in the roots. This season's experiments will fully determine this, and then arrangements will be made looking to the erection of a factory in Boise for the manufacture of sugar" The Telegram of Kansas, says: "The Topeka sugar mills are to be rebuilt at once, and the company is arranging to plant a large acreage to sugar beets with varieties imported direct from Germany. If the experiments with them are successful, 200 acres more will be planted the year after. The idea is to have the beet crop to work on after the sorghum harvest is over."

From other documents in our collection it would seem that our Kansas friends will make a mistake in their imported seed. Those who have experimented with sugar beets in this country seem to be pretty well agreed in the opinion that imported seed does not give the best results, but that the best results come from seed raised through two or three generations in this country, say third year seed. It takes about three years to bring about proper naturalization to our peculiar conditions. The Grand Island people are fully down to this conviction, and Rev. George W. Chalfant tells us, through the Nebraska Leader, that "the best variety of sugar beet found among those now being worked up at the Grand Island, Neb., sugar factory is the 'Sea beet.'" The original seed appears to have been obtained from Holland, and Mr. Chalfant says the variety seems to improve with every additional year of its culture here.

It is scarcely necessary for us to state in this connection that the sugar beets belong to varieties differing widely from the ordinary beets of our garden culture. They are usually of a whitish or yellowish color, and under treatment with that end in view may be grown to enormous size. We once raised a sugar beet that weighed seventeen pounds. But those large beets are not the kind wanted by the sugar manufacturer—he wants a comparatively small and long beet. The large and overgrown beet is always comparatively poor in saccharine principles.

In preparing the land for sugar beets it should be deeply worked, and, if clay land, made to contain vegetable matter sufficient to keep it friable. No stable manure must be added, as this seems to damage the saccharine qualities of the product. The sugar beet appears to require a naturally rich soil—rich enough to produce it without the addition of fertilizers other than plain vegetable matter to prevent baking or packing. The uniform small size of the product is secured by planting close.

As stated on a former occasion, we are satisfied that Texas has every requirement for the successful culture of sugar beets. The crop would get the full advantage of our regular rains early in the season. These would develop it to sufficient size of roots to entirely fit the popular demand. After this size has been attained a dry season to follow is best for the crop, as it prevents second growth it develops a higher percentage of saccharine matter. The same rule holds good with all root crops—the sweet potato is always sweeter after lying awhile in an inactive state than it is while growing.

It is certainly gratifying to us to learn that our people are interesting themselves in this sugar beet question. If it is really so that there is a great sugar belt in the country, and that we are in it, we ought to be hustling with a view to getting for ourselves out of it all there is for us. And on this account we hope all Texans who may have happened to test sugar beets will at once send samples to Gen. R. A. Cameron, commissioner of immigration, Fort Worth, Tex., as per his request already printed in THE GAZETTE. Those interested in the progress of Texas who have not as yet made such tests should procure a few seeds and make the tests next year. Mr. Cameron says small packages of German seeds can be obtained through your congressman at Washington, free, of course, and larger quantities through the same source at actual cost. This is, perhaps, the best you can do in the way of seeds. While American seeds might be better, it is not at all certain that they, acclimated to some other locality, would be any better for Texas. The probability is that for very best results Texans will have to acclimate their seeds to Texas, and if so, German seed would stand a fair chance of being as good to start with as would seed from any other region.

In our own mind we are fully satisfied as to how all well-made tests will pan out. If properly conducted they will prove the sugar beet to be an entire success with us, and following close upon the heels of this proof will come the great beet sugar mills. And in this connection we might suggest it as a good plan for tests to be made in concert by the citizens of a particular locality, for it is but reasonable to suppose that the localities first to make a really good showing will be the first to get the big sugar mills. A sugar mill costing half a million dollars or more, and taking at good figures the agricultural products of a region will be no bad thing for that particular region to have. The matter is certainly one well worth looking after by our farmers' organizations. Say ten members of some Alliance should next year each cultivate one-fourth of an acre to sugar beets—that concerted experiments of theirs might secure one of the big sugar mills. But even should this not happen, there could still be no loss to the experimenter, for those sugar beets make a first-class stock feed.

On Judging Wool.

The Town and Country Journal of Australia says comparatively few people know how to judge a sheep with a view to finding out the quality of wool it produces. The finest and softest wool is always on the shoulders, hence an expert at judging sheep invariably looks at the wool on the shoulders first. Here he establishes his standard for the fleece. Of course the wool of other portions of the animal will not be quite so fine, but if it comes well up towards the standard the fleece can be pronounced upon as "very even," which is an important requirement. Next scrutinize the length of the staple, and if found that the wool on the ribs, thigh, and back approximates reasonably in length to that of the standard, the decision may be made that the wool is also "even as to length." Density of the fleece is next to be looked after, which is done by closing the hand upon a portion of the rump and loin wool, these points being usually the thinnest and most faulty. If this again gives satisfaction, the wool is pronounced "even as to density." This all together makes up the correct fleece; in other words, if the wool approaches in fineness to the shoulder standard, and is nearly of equal length on shoulder, rib and back, and nearly of equal density on shoulders and across the loins, the sheep may be pronounced upon as "a perfect wool producer in its grade."

"The Battle of the Breeds."

One often hears this expression nowadays in its reference to the cattle interests, but it really carries no correct meaning. There is no "battle of the breeds"—if there is going on a battle at all it is simply a battle of the breeders, due to wholesome competition, which is all right. One breeder makes a specialty of a certain breed of fine cattle, and it is entirely right and proper for him to make the most possible out of his business. With this end in view he represents his as the best breed, and doubtless his representations are correct, so far as relates to the purposes to which a man desires to apply his stock. There are many men of many minds—and many purposes—and therefore we have need of many breeds of cattle to fill the general demand. In our opinion Texas (or any other cattle region, for that matter), has not one breed of good cattle too many. There is no battle of the breeds—we have room enough for all of them.

The man who buys the stock for his own use, is the man who must decide the battle of the breeders, and he must do it through a careful consideration of what he wants the stock for. And to work this consideration up to his own advantage there are lots of things he should look to that do not always appear on the surface to the most casual observer. He must not depend upon past reports for his guidance, for the world is in an age of such rapid progress that the things of only half a decade back may have been entirely superceded by the things of today. The vices of yesterday, so to speak, may, through the aid of science and machinery, be figuring as the leading virtue of to-day. For instance, says the editor of the New Dairy, writing on this same subject, one breed of cattle may yield a tremendous quantity of milk, but heretofore that milk has been considered so poor in butter fat that the breed was not regarded with favor as a butter breed; but now here pops to the surface the newly invented "extractor," which whirls all the butter out of 1800 pounds of milk in less than an hour. Upon this builds the question: Does that 1800 pounds of milk yield as much butter as would 800 pounds that might be had from the same number of so-called butter cows, as it took in some other breed to give the 1800 pounds? If the 1800 pounds of milk yields as much butter as the 800 pounds, then there is nothing left to argue over, for the "extractor" has made it as easy a thing to get the butter from one quantity as from the other. Of course the milking process has called for some more labor in case of the larger quantity, but then the breed yielding the larger quantity was a large breed, and therefore a beef breed as well as a milk breed, and this fact can no doubt be made to cover all outlay involved in the extra milking. Then that extra quantity of milk left after an extraction of the butter is not a thing of no value. It feeds the calves and it feeds hogs, and these collaterals are just the same as so much cash in hand.

If the purpose of a man is to produce cream or butter only, then the smaller butter breeds are perhaps the cattle that he should choose, but should he wish to produce beef also, then sound reasoning will direct him to the larger breeds. He will then, in either case, proceed to weigh the comparative cost of keeping in its relation to results. Which breed eats the most in its production of given results, and which will live the longest and do the most work in a lifetime under average treatment? If the big cow eats more than the little cow, does she not live longer and do more proportionate work? Is it not cheaper to carry three tons of cow in four skins than in six? Is not the cost and the risk in running these extra milk and butter "machines" greater in proportion than would be that of running the same material wrapped up in a single skin?

All these things are to be considered by the purchaser, and after their due and intelligent consideration it will be found that there is no "battle of the breeds," but ample room for all.

Abusing Horses.

The Southern Cultivator says one of the most serious fault to be pointed out in not a few hired men lies in their disposition to abuse horses placed under their charge. It is true that farmers through scarcity of the "help" supply are sometimes forced to employ men that they would rather not have, could they help themselves, yet every farmer ought by all means to make a strenuous effort at filling the place of all such men as will not work a team without abusing it. Some horses have more intelligence than the men who work them, and it may be added that abuse of horses is by no means confined to hired hands. The writer has occasionally known a man whose temper was so violent that he could not resist the temptation to abuse his team. When a man has trouble with his horses and cannot manage them as well as he may like, in nine cases out of ten it is his own fault. There are but few horses that are not tractable and docile if they are treated properly. It might be well for him to investigate the matter if he does not get along with the management of horses as well as he ought.

It is a matter of some importance to be able to handle horses properly, and a worthy motive that prompts a man to become proficient in this direction.

Pickled Pork.

A correspondent of the Indiana Farmer gives his plan for putting up pickled pork, which, he says, always proves entirely successful:

To each gallon of water add one and a half pounds of salt, half a pound of brown sugar and half an ounce of saltpeter. Boil all together and skim off such impurities as may arise to the surface. Place in an open tub to cool. Pack the meat closely in a barrel, and when the pickle is entirely cool pour it on. Weight the meat down to keep it well under the pickle, or, if the barrel is entirely full, head up. The meat should have been cut up and laid upon boards sufficiently long to drip out all blood and become entirely cool before packing away in the barrels.

Irrigation in Georgia.

Col. Sidney Herbert, agricultural editor of the Atlanta Journal, says irrigation means greater prosperity, even in that state of heavy rainfall. Impressed with this fact Mr. Weaver Jones of Madison will soon sink an artesian well to be employed in irrigating his plantation. His lands do not lie entirely favorable for irrigation, but he will terrace them in such a way as to admit running the water over them. To get a good outflow in his neighborhood a well must go down about 3000 feet, but even that drawback does not deter Mr. Jones, for he well knows that irrigations will enable him to make regular and immense crops.

It would doubtless be a good thing for Texas if all her farmers living in the regions where artesian wells can be had at such comparatively small expense were possessors of the faith in irrigation that is moving Mr. Weaver Jones of Georgia.

Manuring the Orchard.

The land may be entirely rich in its natural state and yet lack some element of plant food needed by the orchard tree to make it do its best. An experienced fruit grower has asserted that fruit trees cannot thrive and do well any more than cows or hogs without proper feed. Most people generally expect too much of land in orchard. They not only do not fertilize their trees, but stop manuring the crop planted. This policy is suicidal, for after planting and waiting for trees to come in bearing it would certainly be economy to have them bear paying crops for a long term of years. Of course one may not know exactly what element the trees stand in need of, but he can always get rightly at the thing by applying abundantly some kind of perfect manure, allowing the trees to hunt out what they need. The trees will always attend to that matter. Stable or cowlot manure approaches very nearly to a perfect manure.

Farmers Living Better.

Mr. John M. Stahl, editor of the Quincy (Ill.) Farmers' Call, says he is heartily glad to notice that farmers throughout the entire country are as a rule fairly entering upon an age of advance towards better living, generally. They are stepping to a higher plane, and it is altogether good that they should be. God made beautiful and fine and elevating things to be used and enjoyed, and a man is both happier and better because of magazines and books and music and paintings and carriages and handsome furniture. A nice dwelling has a tendency to make a man better, not worse; good neat clothing raises a man up, it does not pull him down. If farmers can afford this better living, it is wholy a good thing; but of course much depends upon whether or not we can afford it. But all progressive farmers are certainly moving towards a better condition for affording it than characterized a decade of years back.

ANSWERS TO CORRESPONDENTS.

This department is devoted to answering such questions as may be asked by our subscribers, which may be of general information. Inquiries of personal character that require answer by mail should always have stamps inclosed. Please give full name and postoffice address, in addition to any such signature as "Subscriber," or "A. G. D.," not for publication, but to enable us to communicate promptly with the inquirer. Parties desiring answers by mail must inclose stamp for return postage.

What Irrigation Has Done.

I am a temporary resident of your city, late from California, and since my sojourn here have been reading the agricultural department of the Fort Worth GAZETTE with keen interest, and especially the admirable articles appearing in it on the subject of irrigation. I can assure you there is more for Texas in irrigation than persons without experience in that direction would ever dream of. Away back the people of California looked upon irrigation about as the people of Texas now seem to be looking upon it. Many of them thought it might be a rather fair thing in localities where it could be easily applied, but that it was no real necessity. But a few persevering persons like yourself thought they saw much for California in irrigation, and so kept hammering away in its favor until they eventually got the ball in motion, and now irrigation is one of the biggest things in existence for the Pacific slope. It has built California up from about nothing in that line to the leading agricultural and horticultural state in the Union. Irrigation has panned out more gold for California than was ever panned out from her mines. For instance, at Anaheim, in Los Angeles county, where I have my home, there existed not very many years ago little more than a barren waste. The people who lived there managed to get along after a way, and while they cursed California agriculture as something without profit, they couldn't think of any means by which it could be made more profitable. Indeed it is more than probable that they never thought much about any chance for greater profits. But finally irrigation got hold of the region and the whole valley was put under the system. A great change for the better at once took shape. Eventually most of the valley was planted out to English walnuts. Nobody seemed to know much about why they were planted—it seemed to be the result of a kind of craze for planting English walnuts. They didn't seem to much interfere with other crops, so everybody planted walnuts merely because it was fashionable to do so.

Well, those walnut groves are now just coming into good bearing, with the full promise of continuing to bear for 100 years. They bring to their owners in clear cash from $400 to $500 per acre, and the entire crop of the valley has footed up for this year not less than $20,000. Only twenty-seven trees were planted to the acre, but each tree yields on an average $30 worth of nuts—the yield will be much heavier as the trees grow older.

Nineteen years ago the county of Fresno was a desert given over to the jack-rabbit. Nothing could be safely trusted as a summer crop because of expected drouth. In 1871 an irrigation canal was completed and it brought in 500 new settlers. The starting outlook was not at all encouraging to the canal company, but more colonists came next year, and they continued to come until now there are 25,000 people settled along that canal, and the lands have advanced in price from $2 an acre to $50 to $500 an acre. Fresno county now has sixteen canal systems, with 80,000 acres in grain and alfalfa, 20,000 acres in vineyards and 8000 acres in orchards. And irrigation has done it all. A. L. MCVEY.

Fort Worth, Texas.

This letter calls for no comment from us. The writer has made out his case with a degree of clearness that could not be bettered. He has plainly shown that while a good country with uncertain rainfall may sustain a light population, after a way, a good country with uncertain rainfall cannot, under a correct system of irrigation, do otherwise than become a great and populous country.

A Remedy for Drouth.

You are having a great deal to say in favor of irrigation as a remedy for drouth, but it must be remembered that there are many farmers in Texas who are so situated that it would not be possible for them to irrigate their lands. In such case what would you recommend as the best course to pursue with a view to so far as possible, meeting the disastrous effects of drouth? TURNER ECHOLS.

Black Creek, Kendall County, Tex.

Deep preparation of the soil for the crop, and, if possible, working into it a liberal amount of well-rotted vegetable matter, is the first thing to be attended to. Deep preparation is important, even though you cannot apply the vegetable matter. The office of the vegetable matter is to prevent packing or baking in severe drouth. The next thing is shallow and frequent cultivation after the crop is started, provided, of course, that it is a cultivatable crop. It is always best to get over the land with your shallow cultivation as soon as possible after each rain—don't wait for weeds or grass to call your attention to the need of cultivation. You have, doubtless, heard a great deal about mulching (spreading some kind of litter over the land) as a protection against drouth. It is a correct principle, and this is why the shallow cultivation is recommended—it is to form a mulch. There is no better mulch than a surface layer of finely-broken soil, and certainly none other is so inexpensive. With this deep preparation and surface mulch of loose soil you get the full benefit of all moisture passing in the air, even though none of it should be let down as rain. You will be able to notice a livening up of your crop so often as a shower of rain passes in your neighborhood, though it may be miles away. The shower imparts moisture to the atmosphere, which passing through your porous soil leaves a portion of that moisture condensed. The soil-mulch at the surface prevents the moisture's rapid escape. But in the case of a close and compact soil there are no openings for the atmosphere to pass in at, and hence no condensation of moisture. The dews of night are husbanded in the same way. A clipping in our scrap book from the New York Examiner says: My remedy for drouth is oft-repeated shallow cultivation, and long experience has proved it to be far superior to mulching with straw or similar material for conserving moisture in the soil. My onions and beets have grown to a very fair size, and peas yielded an excellent crop of well-filled pods, though the ground to a depth of sixteen inches seemed as devoid of moisture as a keg of powder. Everything on the place that received constant shallow cultivation has withstood the severe drouth and heat remarkably well, while everything neglected in this respect is now withered and almost lifeless or dead.

Wants Us to be Funny.

I am no agriculturist, but I read the agricultural department of THE GAZETTE entirely through with decided interest every week. I am just beginning to learn that agricultural literature is good reading, even for persons who are not agriculturists. It may not be all alike, but I find in this agricultural matter of THE GAZETTE a vein of droll humor running through the dryest subjects that cuts out all their dryness and makes them pleasant reading. Then, there are many new and original hits that are decidedly funny. Give us plenty of these.

Fort Worth, Texas. A LADY.

We don't claim to be funny in anything we write. It is our rule to speak of things exactly as they appear to us, and if it so happens that they are funny things then, of course, we cannot be held responsible for their appearing to others as they appear to us. We don't dare to make any attempt at being funny. To borrow from Dr. Holmes, "It wouldn't do for us to be as funny as we could," or words to that effect. Of course the whys in the two cases belong to widely different varieties. The idea intended to be conveyed by Dr. Holmes was that should he fairly let himself out at being funny he would become a criminal through causing people to laugh themselves to death, but our fullness of an attempt at being funny would carry the reader to a very different extreme. It would make him feel so sad that friends meeting him would naturally jump to the conclusion that he was just on the eve of some great financial calamity, and that either "to be or not to be," or "to skip or not to skip," was the question uppermost in his prevailing thoughts.

Carbolic Acid for Curculio.

An agricultural paper that I am taking says diluted carbolic acid thrown over plum or peach trees early in spring will entirely protect the fruit from curculio. Do you know anything about this remedy? Would you recommend it as something to be safely relied on? We can raise both plums and peaches to perfection here, but we find it hard to get much ripe fruit entirely clear of worms. CHAS. POUISSON.

Lampasas county, Tex.

We have ourself read of late a good deal about that curculio remedy, but can say nothing concerning it from personal experience or observation. Our reasoning would set us rather against it as something to be safely relied on. Professor John Martin, assistant state entomologist of Illinois, says in a late publication: "As the curculio comes forth in spring, it must be some distance from the fruit that is likely to become victim to its ravages. Through some sense, probably smell, it is attracted to the fruit. Hence the remedy suggested and practiced by Mr. J. N. Stearns of Kalamazoo, Mich., to mix one pint of strong crude carbolic acid with fifty pounds of newly slacked lime, and throw this into the trees in the early morning while the dew is still on. The theory is that the strong odor will disguise the trees so the curculio will not find them, or else is so repugnant to the weevils that they will give them the go by. "Two years ago I tried this remedy with seeming success. One year ago and this year I tried it most thoroughly, and with no success at all. Trees heavily powdered before the curculio commenced their attack had in a week not a single unstung plum, though there had been no rrin in the interim. The trees were small, so, though they were in full bearing, the plums were not very numerous. I consider these tests crucial. While I would not say that this treatment might not sometimes do good, and possibly save a crop, I do say emphatically that it is not reliable and cannot be depended on to save our plums. I am sure that I applied this material more thoroughly than most growers would do."

Grafting the Pecan.

In your advocacy of pecan culture for Texas you are certainly hitting the nail squarely on the head. But, as you suggest, starting a grove without knowing positively that you are starting with desirable varieties is rather a risky thing for one lifetime. Cannot the pecan be successfully grafted like the ordinary fruit trees? W.

Madisonville, Tex.

The pecan is sometimes grafted, but it is rather a hard tree to graft. All the hickory family, of which the pecan is a member, is regarded as hard to graft. We have succeeded in grafting the pecan on the pecan and also on the butternut hickory, but our per cent of success has been comparatively small. Our method was cleft grafting in the base of the stock where it grew. We'd always prefer planting the nuts and starting a grove of seedlings. If the nuts of a desirable variety can be obtained from a tree growing a few hundred yards from any other pecan tree, or at least from a tree of inferior variety, they will be very apt to come true, but it must be admitted that planting nuts without knowing whence they came is rather a risky business, for different varieties will sometimes cross on each other to a material change in the character of next generation's fruit.

Second Crop Apples.

Mr. E. P. Lingenfelter of Fort Worth has sent us half a dozen very pretty little apples, representing a second growth on his tree for this season. They are near the size of wild goose plums, and the seeds are almost ready to turn when the frost struck them. The blossoms from which they sprung came out after our first rain following the summer drouth. This confirms our theory to the effect that the trees in this portion of Texas go into a regular rest when the dry season is upon us, and then start into a new spring, as it were, when the fall rains appear.

Such freaks as presented by Mr. Lingenfelter's apple tree are very exhausting to the tree, and much against heavy fruitfulness for the next season.

POPULAR SCIENCE.

Typhoid in Garden Truck—New Method of Treating Bone Fractures—The World is Wobbling—A Rival of Electricity—Greatest Aerolite—What is Sugar, Etc., Etc.

Dr. C. M. Cresson has somewhat stirred up the people of Philadelphia by announcing the discovery of typhoid bacilla, in large representation, in the common garden celery. The idea advanced is that garden vegetables raised by heavy manuring are a very propagation house for typhoid fever. What next?

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The next great scientific discovery is heralded from Havana, Cuba. A medical student there has found that an application of phosphorus in the case of broken bones causes those bones to unite in half the time required for them to do so without it, and the union is firmer. The phosphorus is given internally in the form of phosphide of zinc, from one-eighth to one-quarter of a grain daily. A knowledge of the fact that phosphorus enters largely into bone structure gives the thing a high degree of plausibility.

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It has long been thought by many that our marked change of seasons as to uniform character must be wholly due to some peculiar condition upon the earth, and not to outside planetary influences as some contend. Mr. M. Radau has just announced to the Paris academy of sciences a new theory of his own, going towards an establishment of the former theory. He says a movement of the sea causes the changes, by forcing the earth into a slight deviation of axis. By calculations carefully made he has decided that a mass of water 500 cubic miles in extent could produce upon the whole earth an effect large enough to be felt.

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Compressed carbonic acid gas is now coming into use on shipboard for freezing meat, brine being cooled by the expanding gas and circulated in pipes. On a steamer which carried 39,000 carcasses of mutton to Liverpool from South America the meat was kept in excellent condition by this process, with a saving of four-fifths of the former coal consumption for working the refrigerating machinery.

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New interest is awakening in compressed air as a means of distributing motive power. Birmingham, Ala., has been experimenting with it on a pretty large scale, and Professor Lupton says it has been discovered that the air from the street mains may be applied to either light or heavy work, the engines now used by consumers in Birmingham varying from one-half to fifty horse-power in size. The loss by friction through traveling by pipes is slight, even at a distance of two miles, and the indicated horse-power at some of the places served is as much as 73 per cent of that at the compressing station. The compressed air may be used for driving electric lighting machinery or for working street railways.

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Those "shooting stars," as we call them, are meteorites or aerolites. They are composed of a hard, irony substance, which is usually destroyed in the passage of the body through the atmosphere, before the earth's surface is reached, but not always. Aerolites of considerable size do sometimes reach the earth, and the largest one now known on the Western hemisphere has lately been safely housed in the national museum of Brazil, at Rio Janeiro. It weighs 11,800 pounds. Originally it lay imbedded in the ground near Bendego creek, in one of the most inaccessible portions of Brazil. The cost of transporting it from the place where it first struck American soil was defrayed by Baron Greahy. The survey of the route and preliminary arrangements occupied three months; its journey to the capital occupied near five months more.

During the more than four months that it was being hauled and rolled through the wilderness to the nearest railroad station by man and mule power it crossed over 100 streams of all sizes, was taken over one mountain chain 8700 feet in height, besides many smaller elevations. All of this in a region where the best roads are only mule paths. The pluck and energy displayed by the Brazilian scientists in moving this gigantic airstone to their national museum is a curious commentary on the scientific ideas of the early part of the century, which denied the existence of such bodies as aerolites. It furthermore speaks well for the advanced state of science in Brazil.

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The investigation of color blindness made within the past few years in connection with railroad interests has astonished the world at the extent of characteristic color blindness found among the people. The railroad investigations roused curiosity with reference to the matter and led to quite a general investigation throughout the civilized world, and it is now estimated that fully 4 per cent. of all the male inhabitants of the world cannot see green and red correctly, though the per cent. is much lighter with females. With a still larger per cent. there are slight differences of color sense, partly due to the differences of habit and training, but of little or no practical importance. Many who are not color-blind are surprisingly color-ignorant, seeing colors perfectly but being unable to name even the most common.

In case of the real or primitive colors, the greatest defects are found on red and yellow, especially at night, some being "blind" on one of these colors and some on the other, but rarely on both in the same subject. To those "blind" on yellow, the yellow color entirely fades out under artificial light, leaving only a clear white.

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"What is sugar?" is a question one often hears asked. In his "Cantor Lectures," Mr. R. Bannister of London undertakes to answer this question by stating that the sense of taste, which resides in the gustatory nerves of the tongue, seems to have been provided for the purpose of guarding against the taking into the system, through the mouth, of any corrosive or injurious substances, and also for the purpose of imparting pleasure to the necessary act of eating or drinking. That it has been given to man as a source of true enjoyment is undoubted, when indulged in moderation, but otherwise it provides a fruitful source of mischief, through putting too much work on the digestive organs. The sense of taste divides all substances presented to it into four heads—sweets, bitters, salines and acids. Sugar, when taken into the mouth in a solid condition, is speedily dissolved by the saliva, and in that state is able to stimulate the division of taste known as sweetness. It is an important constituent of milk, and as it is the most easily digestible heat-maintaining substance it is not surprising that it should be found in the milk of mammalia. Though an important constituent of a normal diet, it would not maintain life in itself, and animals fed on it alone, without the addition of nitrogenous foods, soon die. When taken into the stomach it passes unchanged into the blood, and is there changed into carbonic acid gas and water, a change which is accomplished by the evolution of heat. Consequently sugar, whether in its natural state or as produced by the digestion of starch, is one of the agents primarily engaged in maintaining the heat of the body. By reason also of its chemical and physical properties it diminished the oxidation of the fatty and nitrogenous substances of the body, and thus indirectly contributes to the weight of the body and to the deposit of fat in the subcutaneous tissues, whereby the loss of the body heat is retarded or largely prevented. The instinctive love of sugar seems to point out how well it is adapted to our natural wants. This love is not confined to one nation, wherever it is most easily obtained, there its consumption is found to be the largest.

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Speaking of sugar reminds us that the German chemists, who have already discovered the sweetest substance in the world, and also the worst smelling substance in the world, are now actively engaged on a method for making artificial sugar—sure enough sugar. The group of bodies termed by chemists the carbo-hydrates—because they are composed of carbon united with oxygen and hydrogen in the proportion in which these two elements combine to form water—contain the well known series of sugars, gums and starches. The chemical composition of these bodies has long been known, but a knowledge of their constitution—that is, the mode in which their several constituent parts are put together—has only recently been acquired. This newly acquired knowledge is being taken advantage of by the German chemists, with Professor Emil Fischer at their head, and they expect to soon be able to turn out first-class sugar in any quantities desired without any resort to either cane or beets, or to any of the other substances now employed in the manufacture of glucose. The only thing in the way, it is thought, will be the great cost of the product. It will be too costly to put into successful competition with the old style sugars.